

### **REMARKS**

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action mailed June 26, 2006. The application has been amended in response thereto. Review and re-examination is respectfully requested.

#### **The Examiner's Office Action**

The Examiner rejected all pending claims for failing to define nonobvious subject matter over the teachings of two particular U.S. patents, Tavernier et al. '447 and Muir '772. An indefiniteness problem in claim 18 was also cited. The claims have been amended to more particularly distinguish the subject invention from the teachings of the references and to correct the cited problem with respect to 35 U.S.C. §112.

#### **Disclosed Embodiments**

The present embodiments relate to a watermarking scheme for paper document where under normal front side illumination (i.e., from only the one side that is being viewed) one sees a first image comprising the printed information on that side. A "back" illumination is an unnatural lighting condition for viewing printed information on a paper document. It is intended as an advantage of the present embodiments that a front-lit illumination will not reveal the watermark. Accordingly, the present embodiments comprise a method and apparatus wherein duplex printing on a paper document (printing the front and back sides of the document) is implemented in a manner for forming a visible watermark only upon a show-through illumination of the document. In other words, the watermark results from half tone pattern interaction between the front and back images on the document only when viewed with a back light, but the watermark is invisible upon mere front-lit illumination of either of the sides of the paper document by themselves.

#### **The Cited Art**

The principle cited reference of the Examiner, the '447 patent, teaches overlaying toner particle patterns for introducing security features in a document but fails to teach watermarking of duplex printed documents in accordance with the embodiments of the

subject application. Applicants disagree with the interpretations of the statements in the '447 patent as they are applied by the Examiner to substantiate the teachings of elements of the present claims.

More particularly, and with reference to amended claim 6, the Examiner will note that the embodiment has been limited to a duplex printed opaque substrate document having distinctive images on either side of the substrate. As the Examiner has indicated, an opaque material is different than a transparent and translucent substrate. (The Examiner's Action mailed January 29, 2004, at page 2.) This is important in regards to the express statement of the '447 patent that its security features can be introduced via . . . registering on both sides of a transparent or translucent substrate, . . . col. 5, lines 51-58). It is also important relative to the further teachings of the '447 patent which failed to put any enabling disclosure of interacting patterns on the first and second side of the document which interact through a local phase, frequency or angle shifting of halftone patterns. The Examiner points to col. 9, lines 25, 26, for a suggestion of screening of the halftone patterns at different angles to create a visible moiré pattern. In other words, the patent's teaching is limited to a transparent substrate, and importantly so, because a transparent substrate will necessarily require the same image on both sides of the transparent sheet for the image printed thereon to have any intelligible meaning. However, when the '447 patent expressly talks about duplex printing systems, col. 7, lines 34-46, the security features are only registered through a mis-registering of the first side of the duplex document with the second side. There is no teaching or suggestion of interacting halftone patterns produced through a local phase, frequency or angle shift of the halftone dots. This mis-registering of the halftone patterns is completely different than the shifting described in detail in the present application.

The significant teachings of the '447 patent are that the security features on duplex printing are obtained by misregistration of opposing sides of the document – with no reference whether the image on both sides may be the same or not. When angle shifting is disclosed to acquire a visible moiré pattern, then the same portion of the image must be printed on both sides, because it is limited to a transparent substrate. There is no teaching or suggestion of effecting a watermark pattern by interacting halftone patterns of difference images on either side of an opaque document produced through the local frequency phase or angle shifting.

The Examiner's first teaching reference to Muir '772 discloses one of many known documents that teach a method for implementing a moiré pattern through angle shifting. It is interesting to note that the Muir patent is directed to the opposite purpose of the subject embodiments in that Muir's intent is to eliminate a visually unpleasant moiré pattern. Muir is not concerned whatsoever with interacting halftone patterns from different sides of an opaque duplex print document.

Even if the '447 and the '772 patents were able to be combined, the resultant combination still fails to teach the concept of producing through a local phase frequency or angle shift upon using show-through illumination of two different images. Muir accomplishes a frequency shift along any given viewing direction by varying the orientations of the halftone screens according to their color. The screens must overlap on the same side of the printed document. In contrast, the present application contemplates a method where one image is visible and the second image is invisible when the viewer is viewing the document against the dark background. The show-through lighting does not make the second image visible, but merely enables the overlaying interaction between the patterns to generate the desired watermark pattern.

The '447 patent is not enabling of any embodiment of interacting different halftone pattern images comprising opposite sides of an opaque substrate, by phase, frequency and angle shifting, and is not a viable reference for any rejection based on such a purported teaching. MPEP §2131.01

The '447 and '772 patents are not properly combinable as support for this rejection because of their opposite stated purposes.

### **The Claims Distinguish Over The References**

As the Examiner has previously noted, opaque is different from translucent and transparent substrates. The present application intends that a first image be printed on one side of a piece of paper, and a second image be printed on the reverse side. When the paper is viewed against the dark background, the paper is opaque. That is, none of the image printed on the reverse side is visible when viewing. It is only when the image is back-lit and that the first and second different images can interact in their overlaying halftone patterns so that the viewer can view a watermark on the side that is being viewed. Thus, when the viewer is reading a document against a dark background, all that is visible

is the text or pictorial images of the document on that side. When the image is back-lit, the backside image interacts to make the watermark visible to the viewer. Since the '447 patent fails to teach printing images on opaque paper where the images are different and interact through a local phase frequency or angle shifting, it is respectfully submitted that claims 6, 12 and 17 are defined patentably and unobviously over the teachings of the combined references. The Examiner will note that claim 18 has been canceled to traverse the indefiniteness problem.

### **CONCLUSION**

In view of the foregoing, it is believed that this application is now in condition for allowance and early notice to that effect is respectfully requested.

No additional fee is believed to be required for this Amendment. However, the undersigned attorney of record hereby authorizes the charging of any necessary fees, other than the issue fee, to Xerox Deposit Account No. 24-0037.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to call Patrick R. Roche, at Telephone Number (216) 861-5582.

Respectfully submitted,

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12/26/02  
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